**Research. Career, Eskom, city power municipality , department education, science expo,college institutes school., project**

1**.RESEARCH PLAN:**
**- ENGINEERING TYPE,AND SCUENCE COMPUTER**
**- NAME : TSHINGOMBE TSHITADI**

**-PROVISIONAL PROJECT TOPIC: IMPLEMENTATION FRAMEWORK POLICY COLLEGE AND SCHOOL ENGINEERING CIRCULAR ASSESSMENT POLICE EDUCATION TECHNOLOGY TEACH AND TECHNOLOGY ELECTRICAL SUBJECT SCHOOL QUALIFICATION LEVEL IN ENTREPRERSHIP AND INDUSTRIE SOCIETY COMMISSIONING AND GOVERNMENT MUNICIPALITY TEAM TRAINING WORK GRADUATION ENGINEERING TIMEFRAME .ST PEACE COLLEGE SCHOOL ORIENTATION GUIDE MANUEL POLICY**
**-PROVISIONAL PROJECT EXPO CATEGORY..:**
**- INTRODUCTION:**

the innovation define city power municipality government institutes city jhb delivery matter supply public and private urbanization energy electrical , And define Eskom entrepreneurs commission delivery society government industrial delivery public private energy electrical commissioner .
.the school and college institutes private public define by Education department teaching learner science engineering apprentice and training and assessment of learner intellectual
-need or problem defined : the research implementation problem need to resolve discovery rural and actually technology innovation industrial to integrate system to standard system knowledge support natural sciences design generated analyze combined sheet from school assessment Portfolio college career outcome Assessment information formative and Summative to workplace workshop mentoring components system to be improved or functionnning to the municipality and entrepreneurs industrial to promovate graduation in workplace.
-research questions:
Ask factor job career outcome transition phase learner phase exhibition phase teach beginning, intermediate,seignor get college junior cadet minim functions graduate chief post generation size industrial , development outcome machine industrial problem industrial maintenance support, manufacture support technical science actual system machine computer system news technology robot science energies need career outcome integration human and material support to resolve demand factor in humans size outcome tendered bid and material resource capacity product integration. to resolve team timeframe operational system month daily diary ,
-research time frame :

Project ,importance time frame allocation time table research engineering and science electrical  implementation break time load shedding time industrial loss gain resource human material energetic ,time table adaptation system team synchronization, asynchronous system regulation time table periodic alternative or direction energy production system cost metering production  human time frame to resolve movement frequency response of team step task project in the structure, resonance learner ,metering learner teacher, resonance learner and system robot actually must be synchronized slot frequency, control loop wizard register access card system movement personal in out robot system entrepreneurs synchronization system. speed level up date need to control by human robot system technology.
-Aim : overview : in the review system career learner induction or error implementation framework regulatory mandatory learner human resource in time time frame must adjustable system and resolve registered system administration standard synchronization and stability adaptor system delay register , model rwin city ,wring commission adapted illegally institutes or college need to training system and adapted in system upgrade update register circular policy engineering planning,
-Engineering goals:
Design , facilities learner Engineering entry model ,years learner  up date ,up grade years 2023 to 2018 in college up date and new institutes and news outcyactual tendered job city.
Class model grade 1 to grade 12 level n 1,6 college level , university level , N1 to n6, NQF 1,nqfto 3 qualifications framework n engineering, grade occupation certificate seignor council certificate Engineering, category, frequency term 1,2,3,4 semester move file Portofilio assessment student register Poe's docket case indicator job logine , compare scaling,compare ,comtency rating ,
 Synchronous induction learner speed slot intellectual quotient learner entry exhibition, efficiency learner ,average,
Probability learner gate job integrity post learner Portofolio learner award learner , probably learner job equity engineering and electrician daily meeting.
More less .induction error proefficuence more ,
Goal close tendered minimum graduat learner posted salary recruitment post , maintenace poor,
,-algorith achieve , probably.
- METHOD:
MATERIAL AND EQUIPMENT:
methology specific guidelines assessment formative Summative rebruc,tools assessment learner and teacher ,time table allocation file student file school..workers file employment database file training job and emploie job , humain.
Material stationery information Manuel and automatically system machine laptop computer ,panel system ,design,execise book log book, journal

account book, drawing sheet book,office documents wallet book,bank card register office database employment book, need,
Engineering electrical material,panel projection permit office workplace register government industrial register social,policy defense security register logistics support, space power.
Electrical generation transmission,distribution metering measure tools ,robot it system Port USB ,
Panel, equipment scaling.office study.

-PROCEDURE : description
Learner and teach , Education design technology support science ,and enysupport,
- team step task operation activities career,
Relate argument statement button
Operationel preliminary task.method motivation automation ,register system input output student workclass scaling class career class ,yes statement class yes, implementation print and yes , workplace Eskom or city power available learner place yes  synchronisation or inspection department education or labour gov yes adapted system accountability yes restore file system yes , , relay delay yes compare yes test control loops system yes flip file equity and statement post yes, teach system yes up date course lecons activity yes compare resolution certificate yes occupation yes qualifications yes compare systeme, questions custome system ask resolve yes meet yes training ask component framework yes activate yes implementation yes system restore maintence support system,
Data systems collect and memorise award.
-ETHIC : completed safety.
Circulum policy framework regulatority,quality council trade council engineering, circulum policy, Education regulation regularity irregularite material fault default, insurance quality ,
Health injury or health time frame synchronisation,asynchronous learner , network transmission,generation distribution system synchrone,real time , images time frame safety,time frame framework stability learner , induction learner error learner outcom no meeting or learner gate damage system or break time table  material stationery workplace college affect workplace industrial and municipality breakdown job injury body or robot system industrial registration move inactive receive message or not send or not incomplete,support no survey real no arrival place asynchronous

**LITERATURE REVIEW**

-time frame : project work plan
Plan orientation industrial and supervision.
. orientation industrial : schedule project shift days night
Management supervisor
Humain resource
Management system information
Legal practice

Date :
State,:
post :

- teacher ' mentor comment and suggestion:

-**ABSTRACT**: the implementation framework circulum knowledge circulum policy engineering planing product improvement contractual agreement with register trainer and consultant engineering electrical and computer science engineering static material drawing need discovery Channel partner ways together with the quality plan on being there for system need system generated undergoing next year's and analyse to zero loadshedding or Rental system information recommand theory practice of anticipating dangers social media teach,
-Name : tshingombe
- school name : St peace college.
- grade : 12/ level 6,n 6
Region Gauteng.
- PROJECT TITLE: IMPLEMENTATION
-ABSTRACT :
-PURPOSE:
-METHODE:.

-project management: building for scientific mentor, school,
- views school attending,
Project submitted.
- customer used.
- application award certificate .
Grade expose youth.
- project creating .
- school management projects
Development companies.
- social, science.
-agricuture animal, prody agriculture,
Biomedical chemistry analysis,
- computer data management data science network,St earth science , atmosphere ,climate science,energy, productivity, engineering, biomedical, engineering chemistry, math, algebraic ,plant sciy, physics, astronomy,science,matter,science ,matter ,optic,

-Types of project: scientific investigation: reseat questions and a hypotese, observations and ,
- it involves Colle ,
- engineering computer design , process , according,criteria,build test redesign,retest proto,

-mathrmatic, theoretical,
Print explot,
- quantity hypothy
- creative identify what.
- interest focus specii topic
- determy significant, value.
Topics literature review.
Creating ,ethic ,response research plan ,
Project book,
Take pictures.

**Teacher mentor name**

Teach engineering/ and Education technology.
News are Cree city and commission

Teach engineering youth
Reflections daily
Career mentor
-lesson plan:
-Nano technology and water
What is  nanotechnology,
How small arbobject nano technology,
Where does our water come from ,
How can nanotechnology make safe to drink.
Activity 1,2,3  extension activity.

, -nano technology and mining , wath is natechnology , wath are the danger of mining,how is nanotechnology being used to make safe , activity,2,3 ..
-nanotechnology and energyb,where does ours energy come from,non renewable and renewable energy source ,how can nanotechnology help to build better solar panel , activities,1,2,3:..
.nanometre..
- the are used nano technology science very small ,object ,,..
..
..discy, ..
- apparatus , investigation, write an investigation Questions, write a hypotese for your investigation, procedure for the investigation ..make sure that your hypotheses give a clear idea of step you need ,
- connect your equipment so that you have build circuit shown diagram, beginning by including as completed the circuit observe brightness of the ligthbub, now,observe the brightness of the ligthbub with this shorter length,, torch ,wire pencil lead,wire,, now decrease the length pencil lead that has been included in your circuit once , observe the brigth of the ligthbub with this shorter length of pencil lead ,record your observations,
-analyse your data. Assume the brigthness current and resistance do you notice from  observations,
-Write a conclusion.
Write a clear conclusion to your investigate..
Activity:
Describe the mining danger ,,
-activity : in group of 5 ,6 learner  design and draw a poster showing how nanotechnology is being used to build gas sensors for mines,
- make your poster as clear and colourful as , .
- you teach will assess your using criteria.
- poster is colour and creative , 2 marks,poster shows original idea  2 marks, poster is clearly presented , 2 marks,information on poster is informative. 2 marks, group work learner were included 2marks ,total 10 marks.

2.how to build yourself a bright technical future.
- considering a technical career,..
- let s get down to work ,
- how do I pay for ..
Technical and artisanal not so low skilled job fact skilled,
Revolution age  material age skill..
Myth and facts about technical careers .
Myth choosing a technical course will lead a low paying job ,  career regards status compare,gate stuck on your career ,technical career are not for women ,is dirth work,there is not room for creativity in technical career
Fact : a well qualified technicians or artisan is high demand and will earn good salary , need RSA job technical low, women do justas these career, workplace need clean
, Engineering challenge are practical problem and many need creation nthar where qualifirv,,
.are you fascinated by how something,piece make it up together,do you prefer to make things instead of reading aboutg ides ,doubyou enjoy solving puzzles and problem,does working in team make happy ,would you like to run your business ones day  a career as artisan or technicia ,,
mechanitechnique , electrical,civilengineering technologist
, Let see what you are good at , it can  difficult to decide what your are good at what career you want doing is to use a theory designed, six broad type, realistic,investigative,artistic ,social,entreprise, conversation, occupation personel,
-Are you realistic,are you pracal, CA you fix electrical things,do like explore machine, wath score
-are you investigative , are inquisitive ,can you things abstractly, do you like to explore ides,,analytical solve math problem use computer wath score,
- are you artistic are you creative , sketch draw or paint all ,solve problem in original way, intituive ,use intutii.read stories,play and poetry,imagine,,are you social  are you friend can you teach or train other,do like to use social or interpersonal,are you enterprises,are you self confidence,star project ,do you like to make that affect,
- so what now ,how do you get there ,
Registered Education institut  NQF qualifications.
Career career Pathways, ,school need subject ,wath exactly the Engineering technology field ,electrical,career pet for part..
- birthday planetarium, science activity, ,erupting apples, planetarium show,science show, graphite circuit

Climbing wall package,

Subject in the national curriculum statement grade ,10-13..
Learning field ,elective subject, you need to have selected  subject, subject refer to the ,
-comulsory subject ,home language n,first language,pure math ,
Human social studies ,physical computer, business comeerce managent ,service manufacture eny, design technology, electrical technology,eny graphics design,mecanic

Engineering it... discovery Computer , training , development and support services to existing or prospective , club house safe creative space to learner aged ,prepares learners for full participation in the 4IR and provide exposure to coding ,robotics ,sebt development, graphic design,3 d design ,2 D and 3 D modelling, animation,video production, basic computing , virtual art , year full time development program 180 unemployment youth aged training including cisco,it Ccma ,ccna security Linux,IoT ,C,C++ , python , essential skills and career readiness, instructor training centre essential ,ccna routing and switching ,ccna security ,ccna cybersecurity operation,to existing or prospective , custome accreditation custome 3,_4 day module ,word,excell,access,Nd power point ms office,speciistr training,it also digital literacy, skills, certiport examination ms office , specifical, delivery fundiy depending learner full standard ,..

University. Undergraduate, how do you conscientise students about 4 in their learning ,reality  ,Google self driviy,
- what about the research output research , ..where are you going create new facility .
- complementary roles engineer, design inovate ..role in perspective,
, Career psychological services focus counseling therapy psych education ,career resource ,CV job interview gradust,

to

purpose: 3 ,,phase synchronous machine an electromechanic energy conversion device operate speed of rotating magnetic field , synchronous machine ,bases energy, synchronisation generator, , NS = 120f/ p , number of poles the machine ,
Work.principlr,

-key features, synchronous motor do not starting self , synchronous machine  double excited machine because it requires two input supplies ones stator , synchronous machine,operate at constant speed, called , syncy generator can produce voltage magnitude ,machine lagging,leading unit, syncy motor voltage : equation of synchronous motor,
V =En+Is(Ra+jxs).,  - v = voltage Police ,En back end , I a armature current ,Ra armature resit, resultant voltage difft between the voltage applied V,and back EMF, Internal angle, ER, and tan @= X's/Ra..,back EMF generated , En= ka.alpha,NS..
En=v normal excitation, logging power factor, input power : input power synchy motor  is given pin = v.Ia.cos ,,,pin = √3.v.L.I cos ,where ,, .mechanic power in motor ,Pm=Eb.Ia.cos ( a- alpha) ,,,Pm= Pin - Is.Ra..Pin= √3.VL.I.L cos ..is load angle.gross torque,synchry,speed , stepper motor ,B= Ns-Nr/NsxNr)*360..step angle of rotation ,ms = number of stator , resolution of stepper motor , , loady regulation= change output,no load , output volt,, fault calcule breaker busbare  ,IB= , I/X's=1/x+1/x..
- Implementation and stability inspection, cycle of training ,step take long time
 - psychomotor : and physical requirements of a job analysis survey rate the functionalite requirements of job rating class ,job analysis,process, resultat process , resultating primary resultat job session news , category data, work ,instruction , function,analyse ,PC to collect data and draw , construction job tools ,build task tools up data ,,
- function in the real world introduction student to function ,function machine, functionalite machine easy ngrap, machine input goes same thing happened rules ,input predict output determine the input, input , metaphor by setting large cardbox machine mystery rules ,teacher student can create rules teacher created spread sheet machine,,,,
 -Synchronous system asynchronous effect .phase transition Asynchron 3 space 90,120 , wave ,,
-understand the gradient function slope slip tangent point derivative ,vector function Probly calcul gradient loss function,,gradient scalar function ,have two function partial derivatives,
-Maintenance during operation abnormal yes, breakdown yes, yes scheduling, order , maintence, database yes,yes period, mid term maintence scheduled, monthly equimt inspection ,.
Implementation leader Education problem counter mesirw , trainer, equipment specific,inspection educay yes,inspection trait yes,self , leader Education yes,
- factory dry battery process, phenomenon batteries failling , revolving table, description loss balance,

-implementation ,system analogy,I/0 control  investy application of embedded control controller to real time control algorithm input analogy output implo a closed loop ,how feedback use linearized ,non linear process and resultat in zero steddy ,
generate pwm outputs to implent variable motor ,supply voltage, Implementation a tachometer operational using pic 32 timer ,develop the CP program code to Implementation a pi controller moving average digital filter , monitoring display, reading embedded mechatron ,basic circuit pin microship pic , microprocessor, hardware basy trainer board workstation ,PC running windows,MC1 Linus ,12 v motor switch ,5 v,4A DC power supply,software ,mplabx plib cross ,
Project takeaway how read Nalog compare implent a pwu capture period measure , fundamental digital,open loop and closed ,process control ,
- fundamental concept ,unit introduction process electromechanic I/0 , automate process control engineering deal,automai process,open loop, DC motor speed counter record ,
Transfer functy magnitude response,phase shift ..

-Synchronous , .time period phase move transition job work
vibration robotics system
Mass spring force oscillator ...
Function , mx''+cx''+kx=f(t)..non zero setui mass friction k is the spring constant,f(t), Fourie series periodic function, f(t)= for.cos( wt).
- resonay, control nature frequency, control logic ,circuit ,
- frequency constant , capacitance,static displaced,static voltat resonance ,piezoelectric voltage constant .

Synchronouse  robot dynamic, kinematics and
control ,nomencenture ,operator , kinematics, introduction position represent coordinator , cylindrical, coordination,linear velot,reprensation velocity Cartesian ,rotation mayris ,active ,passive rotation passive rotation, elementary rotation,representation Euler angles, unit , time derivatives of rotation ,generality coordination ,mat lab ,rigid body velocity and acceleration,task space ,co-ordinate corresponding effect, f
- forward kinematics for planar robot ,are and effector ppsity, function rotation matrix c
-% GETULANG XJZ from option matricr ( c) extract x ,yyz Euler angler from % rotation matrices,% ,author,

- xy = a tan 2.(c(2,3),((3,3));
Y=atan 2 (c(1,3),sqrt((1,1)^2+(1,2),c(1,1)
Ph=[x,y,z]
Lifting job ,,,

Synchronouse.
Low of conservation of energy, mechanical energy (kE+PE), conservation, energie.
KEi+PEi+ wnc+OE= kEf+PEF+ Oef
Kinetic eny is key work conservation, PE, done by conservation forct energy are included, equation, problem,step 1. Determine the system,step potential energy conservation,KEi+PEi=KEf+PEf, step step enerivariouse ,object phenom.efficience,
Eff= useful energy or work out/ total energy input....
-Total change in energy of systu,
Δu=Δq(v2-v1),, Δu=IΔtv (I=Δa/Δt)
Total kinetic energy of system energie of system conservation,u = kinetic t, kinetic t=i.vΔt.conductor electric field greadui eneri,colliu t charge total charge vibrat of Tom heat energy conductorP=E/t..
Energy ability work done =energy spent power what meant DP/St, f= dp/ St, St/ St (m.v) , solv equation ,,L.di/St+RT=E°coswt..dE.dt=o demonstrate pendulum force u= m.gh
dE/St>forcing constant function..

-eskom smart meter infrast up grade programme relit supply empower them control consumer,meter consultation process meeting block tariff,meter renewable,customer interface prepay,remote .information meter5,,
-advance measure approach methode, complex energy systems monitoring and control kpi,based on integration of based of active power ..

Lesson teach note:
What's is nanotechnology: is NM one billion the length of matter to pir perspective, diameter average bacty 2500nm long material 100nm nano matert,,,nono scat material, involved the product manipulation nanoscale material products ,nanosciet consists discot and character,
-activity fields nanotechnology, @0 years research plan research ...
- the electronics industry,wath is distinct need between electrical appliances and electronics electrical appliances and t flow of charged particles electronics in this metal conductor copper wire ,found electrical cord home appliances non metallt conductor ketler ,electron ,non metallic

conductor semiconductor found  cellphone..
-nanoelectronics current and future applications.
- origins of nanoelectronics: ,100 atoms ,
- computer hips semiconductor industry:
CPU ,central pro easing units found computer, transistors embedded in silicon, calculatioy per second required keep ,replaced out data technology tubes  1960 s , accordiy to Moore's low named after ,PC transistor ,45 NM ,process 47 million nanoscy transistor distrt accross 26 mm ,compone computer,,
Components found quick retrial storage data volaty data abscen d  use carbon nanotubes , computer switch data retention,data recovery during power cuts,

- molecular electronics:  decrease in size components molecular emerge task performance ,capacitors in electronics device ,capacitor store information, molecular been investigated act incredibly single electron .
- organic light emitting diodes OLEDs : television and computer monitor ,electronic device Thea days particularly handled device  mp3 player ,ligth emirtur ,OLED organic light. Emitting diode 100nm packed betwt conducting film called electront film voltage causes energy ,compare OLED ,screen film, product,
- touch screen : technology as found in many table ,palm computer ,smart phones and news laptop,works , digital signal to control device interwar , layering of conductive film of indium tri oxide Ito , which conductor relay the ,x- y coordonne to processing components of the device ,smart ,ITO  , technology.
1 nanowire can produced to high conductive  transparent subnano wire network allowt hegher screen brightness ,with option of producing flexible screen Ito film,
- improvement batteries:
Devet in battery,lio batteries ,smart phone ..
- risk and safety issue: unique physicochemical properties of nanomaterial electronics industry , safety humait,nano party,microsct,mass ratio risk asst , hazardous nanopt,national occupation health ,incorporate.
- key issue to consider : renewable water energy have  lagged ,, chip manufacture capabilities.
- future risk assessment:
The future nanotechnology in the electronics industry:
- conductor,:material that can transmit heat ligth ,electrical charge in case electrical conductor
 electrical conductivity mesure of electrical current move through material it can see. As opposite of resistance,
-  semi conductor : a material that can conduct electricity.under specifical circulum voltage current flowing through common material .
- led technologie: ligth emitting diode are semie conductor device emit light as current from anode to cathode .to cathode energy  from of photon ,is

release electron through the led device bprocess called electroluminescence,
- transistor , semiconductor terminal current flowi between b,
-capacitor ,an electronic components store electrical  charge consiste two conductive plate separate ,
- electrodes , the anode is the electrode oxidation reaction takes place reduce,
- graphene. Two dimensional one atom carbon atom bonded hexagonal the crystalline alloyrip  structure a pure element ,pencit lead ,carbon nanotubes,hallow cylinder consistent,nested comprised of carbon atoms ,spherical carbon fulleren composed entirely carbon atom in bKk shapp also called buckbakk and buckmnjsterful,they commonly consist 60 or 79 carbon ,physicJ property , of substance relating to both it's physical chemical.

-Metering screen ,ITC manufacture nanotechnology transmission component automate ,,
Synchronouse system , synchronous intelligence it ,